

REMARKS

Claims 1-95 are pending, with claims 1, 8, 15, 22, 29, 36, 43, 50, 57, 64, 71, 78, and 85 being independent. Applicant thanks the Examiner for indicating that claims 85-95 are allowed.

Applicant thanks the Examiner for the Interview granted on October 18, 2005. During that Interview, the undersigned and applicant presented proposed amendments to the Examiner. The proposed amendments are substantially the same as those presented in this Reply. The undersigned and applicant discussed the independent claims, U.S. Patent No. 5,756,400 (Ye), and U.S. Patent No. 4,832,779 (Fisher). The Examiner agreed that the proposed amendments overcame Ye and Fisher. The substance of the Interview is provided in the remarks below.

Claims 1-28 and 57-70 are rejected as being anticipated by Ye. Applicant requests withdrawal of this rejection because, as discussed during the Interview, and as reiterated in the remarks below, Ye fails to describe or suggest the features of amended claims 1, 8, 15, 22, 57, and 64.

Claims 1-7

Independent claim 1 recites a method for manufacturing a semiconductor device. The method includes forming a semiconductor film over a substrate, forming a conductive film over the semiconductor film, cleaning a chamber, placing the substrate with the conductive film and the semiconductor film in the cleaned chamber, and etching the conductive film in the cleaned chamber. Cleaning includes filling a chamber with Cl₂ or a mixed gas of Cl₂ and a fluorine-based gas, and generating plasma from the Cl₂ or the mixed gas of Cl₂ and the fluorine-based gas.

Ye fails to describe or suggest placing a substrate with a semiconductor film in a cleaned chamber to etch a conductive film formed over the semiconductor film. In Ye, the wafer is "overlaid with an aluminum layer which is further overlaid with a patterned photoresist ..." See Ye at col. 4, lines 20-24 and col. 9, lines 48-55. For these reasons, claim 1 is allowable over Ye. Claims 2-7 depend from claim 1 and are allowable for at least the reasons that claim 1 is

allowable and for containing allowable subject matter in their own right. For example, claim 4 recites that the method includes interposing a gate insulating film between the semiconductor film and the conductive film. Ye does not describe or suggest a gate insulating film. As another example, claim 7 recites that forming the semiconductor film over the substrate includes forming an island shaped semiconductor film. Ye does not describe or suggest an island shaped semiconductor film.

Claims 8-14

Independent claim 8 recites a method for manufacturing a semiconductor device. The method includes placing a substrate having a first conductive film and a second conductive film over the first conductive film within a chamber, etching the first and the second conductive film within the chamber using an etching gas, cleaning the chamber, and etching the second conductive film within the cleaned chamber. The chamber is cleaned with a plasma generated from Cl₂ or a mixed gas of Cl₂ and a fluorine-based gas after the second conductive film has been etched.

Ye fails to describe or suggest a substrate having a first conductive film and a second conductive film over the first conductive film placed in a chamber that is cleaned and etching the second conductive film within the cleaned chamber. In Ye, the substrate has a single conductive film such as the aluminum film. See Ye at col. 4, lines 20-24 and col. 9, lines 48-55. For these reasons, claim 8 is allowable over Ye. Claims 9-14 depend from claim 8 and are allowable for at least the reasons that claim 8 is allowable and for containing allowable subject matter in their own right. For example, claim 11 recites that at least one of the conductive films includes W. Ye does not describe or suggest a conductive film of W. As another example, claim 13 recites that the method includes placing a dummy substrate in the chamber during cleaning. Ye does not describe or suggest use of a dummy substrate.

Claims 15-21

Independent claim 15 recites a method for manufacturing a semiconductor device. The method includes placing a substrate having at least a conductive film including W within a chamber, cleaning the chamber with a plasma generated from a mixed gas of Cl₂ and a fluorine-based gas or Cl₂, and etching the conductive film within the cleaned chamber.

As discussed above, Ye fails to describe or suggest placing a substrate having at least a conductive film including W within a chamber. In Ye, the substrate is overlaid with Aluminum. See Ye at col. 4, lines 20-24 and col. 9, lines 48-55 For these reasons, claim 15 is allowable over Ye. Claims 16-21 depend from claim 15 and are allowable for at least the reasons that claim 15 is allowable and for containing allowable subject matter in their own right. For example, claim 18 recites that the method also includes placing a dummy substrate in the chamber during cleaning. As discussed above, Ye does not describe or suggest placement of a dummy substrate in a chamber during cleaning.

Claims 22-28

Independent claim 22 recites a method for manufacturing a semiconductor device. The method includes forming an insulating film over a substrate, forming a conductive film over the insulating film, cleaning a chamber with a plasma generated from Cl₂ or a mixed gas of Cl₂ and a fluorine-based gas, placing the substrate with the conductive film and the insulating film into the cleaned chamber, and etching the conductive film in the cleaned chamber.

Ye fails to describe or suggest forming an insulating film over a substrate and placing the substrate with the insulating film and a conductive film into a cleaned chamber. In Ye, the substrate is overlaid with Aluminum. See Ye at col. 4, lines 20-24 and col. 9, lines 48-55 For these reasons, claim 22 is allowable over Ye. Claims 23-28 depend from claim 22 and are allowable for at least the reasons that claim 22 is allowable and for containing allowable subject matter in their own right. For example, claim 25 recites that the method also includes forming a semiconductor film over the substrate and forming the insulating film over the semiconductor film. As discussed above, Ye does not describe or suggest forming a semiconductor film over a

substrate. As another example, claim 28 recites that forming the insulating film includes forming a gate insulating film. As also discussed above, Ye does not describe or suggest forming a gate insulating film.

Claims 57-63

Independent claim 57 recites a method for manufacturing semiconductor devices. The method includes manufacturing a first semiconductor device. The manufacturing of the first semiconductor device includes performing plasma etching of a conductive film using a gas containing BCl_3 gas as an etching gas in a chamber, replacing the etching gas in the chamber with Cl_2 or a mixed gas of Cl_2 and a fluorine-based gas after the plasma etching, and generating in the chamber a plasma from the Cl_2 or the mixed gas of Cl_2 and the fluorine-based gas before performing plasma etching using a gas that is inhibited from generating plasma by BO_x as an etching gas to clean the chamber. The method also includes manufacturing a second semiconductor device using the cleaned chamber.

Ye fails to describe or suggest manufacturing semiconductor devices including manufacturing a first semiconductor device and cleaning a chamber, and manufacturing a second semiconductor device using the cleaned chamber. In Ye, the substrate is overlaid with Aluminum and there is nothing to suggest manufacture of a second semiconductor device using a cleaned chamber. See Ye at col. 4, lines 20-24 and col. 9, lines 48-55 For these reasons, claim 57 is allowable over Ye. Claims 58-63 depend from claim 57 and are allowable for at least the reasons that claim 57 is allowable and for containing allowable subject matter in their own right. For example, claim 60 recites that the method also includes placing a dummy substrate in the chamber during cleaning and claim 63 recites that the dummy substrate includes quartz. As discussed above, Ye fails to describe or suggest placement of a dummy substrate in the chamber during cleaning.

Claims 64-70

Independent claim 64 recites a method for manufacturing semiconductor devices. The method includes manufacturing a first semiconductor device. The manufacturing of the first semiconductor device includes performing plasma etching using a gas containing BCl_3 gas as an etching gas in a chamber, replacing the etching gas in the chamber with Cl_2 or a mixed gas of Cl_2 and a fluorine-based gas after the plasma etching, and generating in the chamber plasma from the Cl_2 or the mixed gas of Cl_2 and the fluorine-based gas to clean the chamber. The method also includes manufacturing a second semiconductor device including performing plasma etching using a gas containing SF_6 gas as an etching gas.

Ye fails to describe or suggest manufacturing semiconductor devices including manufacturing a first semiconductor device and cleaning a chamber, and manufacturing a second semiconductor device using the cleaned chamber. In Ye, the substrate is overlaid with Aluminum and there is nothing to suggest manufacture of a second semiconductor device using a cleaned chamber. See Ye at col. 4, lines 20-24 and col. 9, lines 48-55 For these reasons, claim 64 is allowable over Ye. Claims 65-70 depend from claim 64 and are allowable for at least the reasons that claim 64 is allowable and for containing allowable subject matter in their own right, as discussed above with respect to claims 58-63.

Claims 29-56 and 71-84 are rejected as being obvious over Ye in view of Fisher. Applicant requests withdrawal of this rejection because, as discussed during the Interview, and as reiterated in the remarks below, the combination of Ye and Fisher fails to describe or suggest the features of amended claims 29-56 and 71-84. In particular, each of independent claims 29, 36, 43, 50, 71, and 78 recites that generating plasma includes applying a dielectric magnetic field generated from the electrode through the quartz adjacent the electrode. Ye fails to describe or suggest quartz within the chamber. Moreover, while Fisher suggests walls made of quartz, Fisher fails to describe or suggest quartz adjacent to an electrode for generating plasma. As Fisher explains, the materials made of quartz are the process gas distributor 120, the cylinder 114, and the piece 116. See Fisher at col. 18, lines 1-60 and Fig. 6. Accordingly, claims 29, 36,

Applicant : Satoru Okamoto
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43, 50, 71, and 78 are allowable over any possible combination of Ye and Fisher. Claims 30-35, 37-42, 44-49, 51-56, 72-77, and 79-84 depend from claims 29, 36, 43, 50, 71, or 78, and are allowable for at least the reasons that claims 29, 36, 43, 50, 71, and 78 are allowable and for containing allowable subject matter in their own right, as discussed above.

It is believed that no fee is due in connection with this reply. Nevertheless, please apply any charges or credits to deposit account 06-1050.

Respectfully submitted,

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/Diana DiBerardino/

Diana DiBerardino
Reg. No. 45,653

Fish & Richardson P.C.
1425 K Street, N.W.
11th Floor
Washington, DC 20005-3500
Telephone: (202) 783-5070
Facsimile: (202) 783-2331

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